

Notes on *Callophrys avis* (with plate).

By Dr. T. A. CHAPMAN.

Some more specimens of *Callophrys avis* having emerged after having given my account of the species to the Entomological Society of London (*Trans. Ent. Soc. Lond.*, 1910, p. 85, and *Proc. Ent. Soc. Lond.*, 1910, p. xxi), I am able to give a few further notes on the range of variation in the species, and to report a very curious result of "forcing." I am also able to present photographs of the living butterfly taken by Mr. H. Main with that perfection that is in no need of further praise from me.

To take first the results of "forcing." Expecting that the pupæ I had would probably emerge naturally in April, and wishing to leave home during that month, I proposed to get the butterflies out before I left by "forcing," and accordingly put some pupæ in a temperature of 60° to 70° on January 23rd, and the remainder on February 5th. The first unexpected result was that two specimens emerged four days after being so placed, and several others a day or two later. These individuals must have differed from their fellows in having already made some progress in the maturation of the imago at the end of January. After a further few days other specimens emerged, and continued to do so till towards the end of February, when they ceased to appear. There still, however, remained some pupæ, and I concluded that my forcing operations had resulted in killing these. However, I left them at ordinary temperature when I left home on April 2nd, and found them unchanged when I returned home on May 13th. The result was very gratifying, as instead of these pupæ being dead, it appeared that they might have been most carefully consulting my convenience, as on May 15th a ♂ emerged, and others during the following ten days, only two pupæ remaining over really dead. The precise explanation of this effect of forcing is not very evident. I ought to say that from the laying of the eggs to placing the pupæ in a warm temperature at the end of January, all were treated alike and had kept fairly well together. The theory I frame on the matter is, that *C. avis* naturally spreads its emergence over a long period, probably from mid-February to well into May, perhaps a period of nearer three than two months. Forcing brought out at once those that proposed to be earliest, and hastened forward those that represented emergences up to perhaps mid-April or later. Those booked for later emergence had made no progress towards leaving pupal conditions, and were in consequence rather retarded than hastened by the too early high temperature.

There is, I think, no record of *Callophrys rubi* passing two years in the pupal state, and *C. avis* (a much more southern insect) would be even less likely to do so. Nevertheless, the effect on these later pupæ would be quite parallel with that on pupæ of species that do pass, upon occasion, more than one winter as pupæ. In these species it is, I think, usual rather than occasional, to find that, if pupæ are forced before they have had proof of winter having come (and gone?), an unusual proportion, or even all, refuse to emerge that year, but "go over." It may be easier to appreciate this curious result if tabulated thus:—

NOVEMBER 15TH, 1910.

January 23rd.—Some pupæ placed at temperature of 68°.

February 5th.—Remainder placed at temperature of 68°.

February 9th.—♂ and ♀ emerged from lot of January 23rd and also from lot of February 5th, and continued to emerge till February 24th.

March 14th.—None having emerged for more than a fortnight, removed to ordinary temperature.

May 15th.—Two ♂ s emerged. Came out at intervals till

June 7th.—Last one emerged.

I may here refer to and correct a curious oversight in my paper in *Trans. Ent. Soc. Lond.*, p. 105. I say that the honey-gland had not been recorded in the *Thestoridi*, as a matter of fact I had myself referred to it in *Thestor ballus* (*Ent. Rec.*, xvi., pp. 279, 281, 1904), and others had done so. The error arose from my writing first *Callophryidi* (including *Callophrys*, but not *Thestor*) and correcting to *Thestoridi*, without thinking of the error so resulting, on feeling satisfied that *Callophrys* and *Thestor* belonged to the same tribe.

In *Proc. Ent. Soc. Lond.*, 1910, p. xxi, I give some notes on the earlier emergences. The later ones differ from those earlier ones in the decidedly greater accentuation of the sexual dimorphism. This is so great as to be quite a specific character (arranging these with the others where it is less strong) in comparison with *C. rubi*. In *C. rubi* it is comparatively absent, and actually very slight. Beyond the androconial band the ♂ s differ from the ♀ s in averaging slightly smaller (in all races?) and in having the "tails" at anal angle more pronounced than in the ♀ s, but there is no difference whatever in colouring. In these late emerged *C. aris* the ♂ s are the smaller, but only slightly, one is 37mm., about that of the largest ♀ s, the smallest specimen is a ♂ 32mm. The great difference is in coloration, the ♀ s are with considerable uniformity of a ferruginous-brown, contrasting as light and bright with the richer dark brown of the ♂ s, whose darkness is enhanced by the often nearly black of the lines of the veins, a feature hardly seen in the ♀ s. The ♂ s vary more in colour than the ♀ s, two are very light, one almost lighter than the ♀ s, the light tint looking even lighter than in the ♀ s in the specimen owing to the contrast against its dark veins. In this specimen the forewing fringes are of the same colour as the rest of the wing (pl. vii., fig. 7), the normal condition being white fringes with dark (blackish) coloration opposite each vein, and tipping each white scale, the amount of black varying in different individuals, more abundant on the forewing than on the hindwing, but never entirely overwhelming the white.

In *C. rubi* the forewing fringes are usually dark, always uniform, and when paler are greyish-white, the individual scales paler (not darker) towards their tips, and with no variation opposite the veins. On the hindwings the fringes of *C. rubi* are markedly white and dark, giving an appearance very often of a tail to each vein.

One eccentric aberration of the ♀ has the left forewing 1mm. longer than the right, with slightly darker hind margin above, and a bluer green below than its fellow.

On the underside there is also a decided sexual dimorphism, the males being of a bluer green. The females have the yellower or almost ruddy tone alluded to in *Proc. Ent. Soc. Lond.* The similar variations in colour in *C. rubi* there referred to, have not, I think, usually any sexually dimorphic character, but are sometimes, perhaps, racial.

The white line beneath varies a good deal, it fades towards the hind margin, so that one may be in doubt in many instances whether to say, for example, it extends to vein 7 or to vein 2. There are several specimens in which it is absent from the forewing; there is always one spot on the hindwing, and it usually extends down four interspaces, perhaps to be reported as visible, but hardly so, for several further spaces in most examples.

The dark margin to inner side of the white spots so usual in *C. rubi*, is present in a few ♀s of *C. avis* on the forewings, distinct only in the interspace between veins 2 and 3 as a brown shade, never on the hindwings, and only faintly indicated on the forewing in front of the space 2-3 in the few cases where it is present.

Mr. Main's photographs of the underside of the living butterfly bring out well the peculiar velvety smoothness of aspect of *C. avis* when alive, as contrasted with the more crisp and sharp appearance of *C. rubi*.

I noticed that though *Coriaria* is the foodplant of *C. avis*, and that the larva could not be got to eat any of the ordinary foods of *C. rubi*, it was, nevertheless, the case that *Coriaria* did not grow at Hyères, although *C. avis* occurred there. The conclusion, of course is, that *C. avis* must have some other foodplant. Last spring (1910) I spent several weeks at Hyères, with a view, so far as entomology was concerned, of finding out something about this. Unfortunately, the season was unpropitious, even *C. rubi*, though on the wing all the time, was often invisible, and scarce even in places where I have seen it abundant. I failed to find a specimen of *C. avis*, so that the only result of my search was confirming the fact that *Coriaria* did not grow there, a fact that the local botanists had sufficiently established, and the question of the alternative foodplant remains for the future to solve.

It seems desirable to note an imperfection in pl. xv. (*Trans. Ent. Soc. Lond.*, 1910), since it is of some importance. It is that of the coloured drawings of the larva, in which Mr. Knight's drawings show certain oblique shadings, bringing out very well the undulating surface of the "slope." In the plate these shadings are accentuated, so that, in the right upper figure especially, they rather show markings than mere shadings to bring out humps and hollows. This is unfortunate, since the fact is that there are no oblique markings on the larva of *C. avis*, a circumstance (with others) sharply distinguishing it from that of *C. rubi*.

I have heard from Professor Mendes (São Fiel) that he has received a specimen of *C. avis* taken in May, 1910, at Jerez. Through Mr. C. Oberthür and Mr. H. Powell, I have been in communication with Mr. E. Holl, from whom I learn that he has a series of *C. avis* taken near Algiers. He has a specimen (♀) taken at Ben-Aknoun, April 6th, 1904. This year he took a number at Maison-Carrée from April 20th to May 1st. He thought they were a form of *C. rubi* var. *fervida*, being struck by the difference of the streaks and spots, and especially on account of their late appearance, April 20th, at about 120ft. above sea level, whilst at Bonzaréa (about 1200ft.), *C. rubi* was taken end of March and beginning of April.

The specimens are smaller than the French ones, 28mm. to 30mm., the ♀ from Ben-Aknoun, 32mm., they resemble Oberthür's fig. 420

of a Tunisian specimen. Both localities are uncultivated, and covered with a variety of plants and shrubs, very similar, apparently, to the rough ground of the Riviera. The place (at Maison-Carrée) where he took the species this year was of an extraordinarily limited area, and he and Madam Holl searched in vain twenty yards away from a bunch of *Lentisques*, to which the butterflies came to bask in the sun, sheltered from the wind. His observations do not suggest what the foodplant is in Algeria.

EXPLANATION OF PLATE VII.

Figs. 1 and 2.—*Callophrys avis* from life. Photographed by H. Main.

Fig. 3.—*C. rubi* from life. Photographed by A. E. Tonge.

Figs. 4 and 5.—Average ♂ and ♀ of *C. avis*, showing usual amount of sexual dimorphism.

Fig. 6.—Rather darker ♂ with pale brand.

Fig. 7.—Male aberration with very light ground colour and brown cilia.

Figs. 4, 5, 6, 7.—Photographed by A. E. Tonge.

The Lepidoptera of Ruffet's Wood and neighbourhood, 1909-10.

By FREDERICK J. COULSON.

Having for the past two summers spent my vacation at Eastbourne, I have been enabled on several occasions to visit that old time locality—the Abbot's Wood region. The following recital of the insects taken or seen upon these occasions may, therefore, it is hoped, be of some interest to those who may anticipate paying attention to this district—more particularly to those, who, like myself, are interested in the Micro-Lepidoptera; though I have to admit that I have not yet passed out of the tyro stage.

My first visit to this locality was on June 16th, 1909, and the district being entirely new to me, the visit was more for survey purposes than for solid serious collecting. Having no entomological friend to indicate the most profitable route, my inexperience prompted me to take train to Polegate, and set out for a four mile tramp along the main road to Hailsham. This route afforded little opportunity for collecting other than hedge searching and beating. The sun was obscured during the greater part of the time, and except for solitary examples of *Polyommatus icarus* and *Coenonympha pamphilus* no butterflies were on the wing. Opposite some old houses, about a mile from Polegate, the spindle bushes were covered with nests of *Hyponomeuta cognatellus*, and the tall hawthorns a little beyond, were greatly disfigured by the nests of its congener, *H. padellus*. Occasionally a larva of *Diloba caeruleocephala* was to be seen resting upon the tips of the sideshoots of the hawthorns, and from the willow bushes in a swampy tract further along the road, some larvæ were picked which subsequently produced *Tortrix rosana*, and some fine dark *T. podana*. From a few ova laid by a ♀ *Coremia ferrugata*, beaten from a clump of salallows near by, the resultant imagines, which emerged August 11th-14th were all red-banded, closely resembling the ♀ parent.

Abbot's Wood was reached in the early afternoon by a path to the left after passing a few houses, and the sun just then breaking from the clouds some hope of good work was entertained. Several examples of *Angiades sylvanus* were observed flitting along the hedge leading to the wood, and in a clearing scattered over with fallen logs, near the entrance, *Brenthis euphrosyne* occurred commonly but in rather sad